

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	13	"3072680"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 10:56
L2	9	"3072680" and amount	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 10:57
L3	13	"3072680"	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 10:59
L4	1	"3072680" and (bicyclo or bicyclic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 11:33
L5	495606	thermoplastic or (crosslink or crosslinked or crosslinking) and (bicyclo or bicyclic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 11:34
L6	6845	(thermoplastic or (crosslink or crosslinked or crosslinking)) and (bicyclo or bicyclic)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 11:34
L7	6	(thermoplastic or (crosslink or crosslinked or crosslinking)) and (bicyclo or bicyclic) and bicyclic near (diester or dicarbonate)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 11:35
L8	4	(thermoplastic or (crosslink or crosslinked or crosslinking)) and (bicyclo or bicyclic) and bicyclic near (diester or dicarbonate) and (lactide or dione)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2005/07/05 11:35

158 209

## SEARCH REQUEST FORM

Requestor's Name: Teresa Boykin Serial Number: 10/726,081  
Date: 7-5-05 Phone: (571) 272-1069 Art Unit: 1711  
10069

## Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevant citations, authors, keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevant claim(s).

Please see attached.

(NOT MUCH OUT THERE CLOSE.)

## STAFF USE ONLY

Date completed: 7-15-05  
Searcher: ES  
Terminal time: 100  
Elapsed time: \_\_\_\_\_  
CPU time: \_\_\_\_\_  
Total time: 115  
Number of Searches: \_\_\_\_\_  
Number of Databases: \_\_\_\_\_

## Search Site

☒ STIC  
☐ CM-1  
☐ Pre-S

## Type of Search

☐ N.A. Sequence  
☐ A.A. Sequence  
☒ Structure (3) (subset)  
☒ Bibliographic (and)

## Vendors

☐ IG  
☒ STN \$360.53  
☐ Dialog  
☐ APS  
☐ Geninfo  
☐ SDC  
☐ DARC/Questel  
☐ Other

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L1 FILE 'LREGISTRY'  
STR

L2 FILE 'REGISTRY'  
SCR 2043

L3 FILE 'LREGISTRY'  
STR L1

L4 FILE 'REGISTRY'  
STR L3

L5 STR L4

L6 SCR 1028 OR 1062

L7 SCR 1515

L8 FILE 'LREGISTRY'  
STR

L9 FILE 'REGISTRY'  
50 S L8 AND L2 AND L6 AND L7

L10 STR

L11 1 S (L8 NOT L10) AND L2 AND L6 AND L7

L12 FILE 'HCAPLUS'  
33 S DRUMRIGHT ?/AU

L13 17199 S HARTMAN ?/AU OR HARTMANN ?/AU

L14 24607 S WOLF ?/AU

L15 1 S L12 AND L13 AND L14

L16 1488 S MONOMER?(3A)PRECURS?

L17 43 S BICYCLIC?(2A) (DIESTER? OR DICARBONAT?)

L18 96 S MONOCYCL?(2A) (ESTER? OR CARBONAT?)

L19 1 S L16 AND L17

L20 1 S L16 AND L18

L21 1 S L17 AND L18  
SEL L15 1 RN

FILE 'REGISTRY'

L22 7 S E1-E7  
 SEL L22 1,2,5,6 RN  
 L23 4 S E8-E11  
 SEL L22 7 RN  
 L24 1 S E12  
 L25 1 S 4481-40-7/CRN

## FILE 'HCAPLUS'

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 L27 19 S L23  
 L28 1125 S L24  
 L29 1 S L27 AND (L16 OR L17 OR L18)  
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L31 SCR 1028 OR 1062 OR 1133  
 L32 STR L8  
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 L35 SCR 1918  
 L36 10 S ((L32 AND L33) NOT L10) AND L2 AND L31 AND L7 NOT L35  
 L37 SCR 1918 OR 1992 OR 2016 OR 2021 OR 2026 OR 1929  
 L38 6 S ((L32 AND L33) NOT L10) AND L2 AND L31 AND L7 NOT L37  
 L39 118 S ((L32 AND L33) NOT L10) AND L2 AND L31 AND L7 NOT L37 F  
 SAV L39 BOY081/A  
 L40 1 S L22 AND L39  
 L41 87 S L39 NOT 2<NC  
 L42 11 S L41 AND ?BICYCL?/CNS  
 L43 76 S L41 NOT L42  
 L44 1 S L22 AND L42

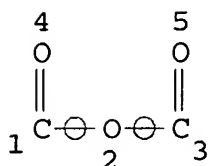
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 L47 10 S L45 NOT L46

## FILE 'REGISTRY'

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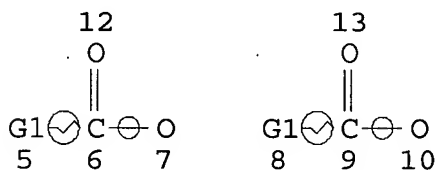
L2 SCR 2043  
 L7 SCR 1515  
 L10 STR



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 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
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 NUMBER OF NODES IS 5

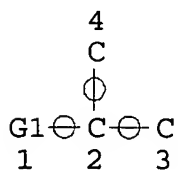
STEREO ATTRIBUTES: NONE  
 L31 SCR 1028 OR 1062 OR 1133  
 L32 STR



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 DEFAULT MLEVEL IS ATOM  
 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
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STEREO ATTRIBUTES: NONE  
 L33 STR



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 DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:  
RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 4

STEREO ATTRIBUTES: NONE

L37 SCR 1918 OR 1992 OR 2016 OR 2021 OR 2026 OR 1929  
L39 118 SEA FILE=REGISTRY SSS FUL ((L32 AND L33) NOT L10) AND L2  
AND L31 AND L7 NOT L37

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SEARCH TIME: 00.00.01

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FILE 'HCAPLUS'  
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=> d 146 1 all hitstr

L46 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2005 ACS on STN  
AN 2002:964413 HCAPLUS  
DN 138:39731  
ED Entered STN: 20 Dec 2002  
TI Copolymers of **monocyclic esters** and  
**carbonates** and methods for making same  
IN Drumright, Ray E.; Hartmann, Mark; Wolf, Richard  
PA Cargill Dow LLC, USA  
SO PCT Int. Appl., 28 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
IC ICM C08G064-00  
CC 35-5 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 37

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 2002100921	A1	20021219	WO 2002-US18443	200206 07

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,

CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH,  
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
 LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ,  
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU,  
 TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE,  
 CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,  
 SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
 SN, TD, TG

US 2003096940 A1 20030522 US 2002-165241

200206  
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EP 1406947 A1 20040414 EP 2002-741975

200206  
07

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
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JP 2004530031 T2 20040930 JP 2003-503684

200206  
07

US 2004122185 A1 20040624 US 2003-726081

200312  
01

PRAI US 2001-296975P P 20010608  
 US 2002-165241 B1 20020607  
 WO 2002-US18443 W 20020607

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2002100921	ICM	C08G064-00
WO 2002100921	ECLA	C08G063/08; C08G063/64; C08G064/02B; C08L067/04+B4K; C08L069/00+B4K; C08L069/00B+B4K
US 2003096940	NCL	528/196.000
	ECLA	C08G063/08; C08G063/64; C08G064/02B; C08L067/04+B4K; C08L069/00+B4K; C08L069/00B+B4K
JP 2004530031	FTERM	4J029/AA02; 4J029/AA08; 4J029/AA09; 4J029/AB01; 4J029/AC02; 4J029/AD10; 4J029/AE02; 4J029/AE03; 4J029/EA02; 4J029/EA03; 4J029/EA05; 4J029/EG00; 4J029/EG07; 4J029/EG09; 4J029/EG11; 4J029/EH02; 4J029/EH03; 4J029/HC06; 4J029/HE01; 4J029/HE04; 4J029/KE07; 4J029/LA12
US 2004122185	NCL	525/418.000
	ECLA	C08G063/08; C08G063/64; C08G064/02B; C08L067/04+B4K; C08L069/00+B4K; C08L069/00B+B4K

AB Copolymers having repeating units derived from **monocyclic esters or carbonates** and certain **bicyclic diesters** and/or dicarbonates have controllable rheol.

properties. The **bicyclic diester** and/or dicarbonate copolymerizes easily with the monocyclic monomers, esp. with lactide, to form copolymer that can have tailored levels of branching. The copolymers have excellent rheol. properties, including increased melt tensions and improved shear thinning, compared to the analogous linear polymers. A typical polymer was manufd. by polymn. of L-lactide at 130-185.degree. with 0.1% .alpha.,.alpha.-2,5-dioxabicyclo[2.2.2]octane-3,6-dione.

- ST cyclic ester **bicyclic diester** copolymer;  
carbonate cyclic **bicyclic diester** copolymer;  
**bicyclic dicarbonate** cyclic ester copolymer;  
lactide dioxabicyclooctanedione copolymer manuf; polyester lactide based branched
- IT Polycarbonates, preparation  
(aliph.; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Polyesters, preparation  
(aliph.; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Molded plastics, miscellaneous  
(blow; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Plastic films  
(copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Plastic foams  
(copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Coating materials  
(extrusion-; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Polyesters, preparation  
(lactic acid-based; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Polymer blends  
(linear polylactic acid blends; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Polyesters, preparation

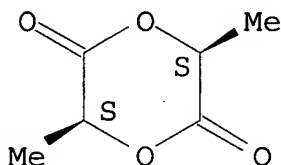


- (polycarbonate-, aliph.; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT Polycarbonates, preparation  
(polyester-, aliph.; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT 478549-47-2P  
(copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT 26023-30-3, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26100-51-6,  
Polylactic acid  
(copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching for blending with linear polylactic acid)
- IT 3479-85-4P, .alpha.,.alpha.'-Dibromoadipic acid  
29548-86-5P  
(monomer precursor; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT 111-50-2, Adipoyl chloride  
(monomer precursor; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- IT 4481-40-7P, 2,5-Dioxabicyclo[2.2.2]octane-3,6-dione  
(monomer; copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
(1) Crawford; US 5340889 A 1994 HCAPLUS  
(2) Tang; US 5145945 A 1992 HCAPLUS
- IT 478549-47-2P  
(copolymers of **monocyclic esters** or **carbonates** with **bicyclic diesters** or **dicarbonates** with controlled branching)
- RN 478549-47-2 HCAPLUS  
CN 2,5-Dioxabicyclo[2.2.2]octane-3,6-dione, polymer with  
(3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CRN 4511-42-6

CMF C6 H8 O4

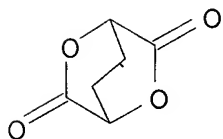
Absolute stereochemistry.



CM 2

CRN 4481-40-7

CMF C6 H6 O4

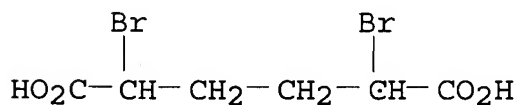


IT 3479-85-4P, .alpha.,.alpha.'-Dibromoadipic acid  
29548-86-5P

(monomer precursor; copolymers of  
monocyclic esters or carbonates with  
bicyclic diesters or dicarbonates  
with controlled branching)

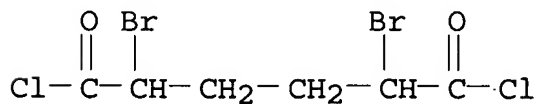
RN 3479-85-4 HCAPLUS

CN Hexanedioic acid, 2,5-dibromo- (6CI, 7CI, 8CI, 9CI) (CA INDEX NAME)

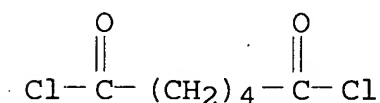


RN 29548-86-5 HCAPLUS

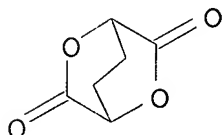
CN Hexanedioyl dichloride, 2,5-dibromo- (9CI) (CA INDEX NAME)



IT 111-50-2, Adipoyl chloride  
 (monomer precursor; copolymers of  
 monocyclic esters or carbonates with  
 bicyclic diesters or dicarbonates  
 with controlled branching)  
 RN 111-50-2 HCAPLUS  
 CN Hexanedioyl dichloride (9CI) (CA INDEX NAME)



IT 4481-40-7P, 2,5-Dioxabicyclo[2.2.2]octane-3,6-dione  
 (monomer; copolymers of monocyclic esters or  
 carbonates with bicyclic diesters or  
 dicarbonates with controlled branching)  
 RN 4481-40-7 HCAPLUS  
 CN 2,5-Dioxabicyclo[2.2.2]octane-3,6-dione (8CI, 9CI) (CA INDEX NAME)



=> d 147 1-10 cbib abs hitstr hitrn

L47 ANSWER 1 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN  
 2004:880413 Document No. 142:56764 Ring-opening metathesis  
 polymerization with [2 + 2]-crosslinking to create new materials.  
 Enholm, Eric; Joshi, Aarti; Wright, Dennis (Department of Chemistry,  
 University of Florida, Gainesville, FL, 32611, USA). Tetrahedron  
 Letters, 45(47), 8635-8637 (English) 2004. CODEN: TELEAY. ISSN:  
 0040-4039. OTHER SOURCES: CASREACT 142:56764. Publisher: Elsevier  
 B.V..  
 AB There are almost no examples of Grubbs'-type ring-opening metathesis  
 polymers that have been [2 + 2]-crosslinked. Two new monomers,  
 dicinnamate and coumarin ester, were used to construct two novel  
 linear sol. polymers bearing photochem. labile moieties for [2 +  
 2]-cycloaddn. reactions. These soft polymers were photocrosslinked  
 into very hard polymers. Potential advantages of these new  
 bio-inspired materials include: (1) ready processing into flat,

round, and cylindrical shapes; (2) reasonably low toxicity due to trace amts. of catalyst needed; and (3) rapid rate of polymn. and crosslinking that avoids acids and bases.

IT 810687-76-4P

(prepn. by ring-opening metathesis polymn.)

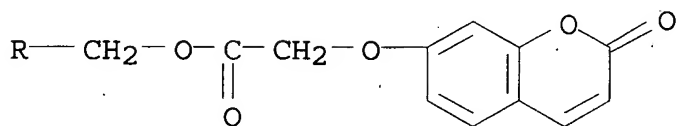
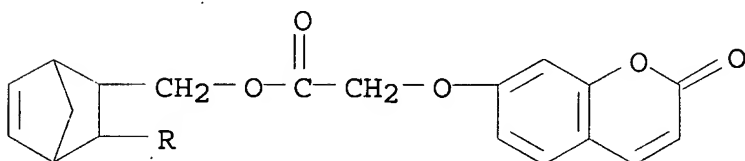
RN 810687-76-4 HCAPLUS

CN Acetic acid, [(2-oxo-2H-1-benzopyran-7-yl)oxy]-, bicyclo[2.2.1]hept-5-ene-2,3-diylbis(methylene) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 810687-73-1

CMF C31 H26 O10



IT 810687-76-4P

(prepn. by ring-opening metathesis polymn.)

L47 ANSWER 2 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

2004:525282 Document No. 141:191139 The crosslinking reaction of bicyclic bis(.gamma.-lactone) with triglycidyl isocyanurate and properties. Zhang, Chenxi; Ochiai, Bungo; Endo, Takeshi (Dep. Polymer Sci. Eng., Fac. Eng., Yamagata Univ., Yonezawa, 992-8510, Japan). Nettowaku Porima, 25(2), 66-73 (Japanese) 2004. CODEN: NPORF2. ISSN: 1342-0577. Publisher: Gosei Jushi Kogyo Kyokai.

AB Anionic copolymn. of bicyclic bis(.gamma.-lactone) with triglycidyl isocyanurate was carried out to obtain the corresponding crosslinked polymer quant. by controlling the copolymn. conditions. This crosslinking reaction proceeded with the successive double ring-opening isomerization of bicyclic bis(.gamma.-lactone) and the ring-opening of oxiranes alternately to obtain the crosslinked polyesters having ketone groups. The structure of the alternating copolymer was confirmed by IR spectra and elemental anal. The glass

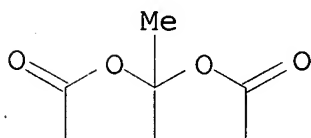
transition temp. of the crosslinked polymers was controllable by the addn. of styrene oxide. The vol. shrinkage during the crosslinking could be suppressed by ring-opening of the bicyclic bis(.gamma.-lactone).

- IT 160893-56-1P, 2,8-Dioxa-1-methylbicyclo[3.3.0]octane-3,7-dione-styrene oxide alternating copolymer  
(crosslinking reaction of bicyclic bis(.gamma.-lactone) with triglycidyl isocyanurate and properties of products)
- RN 160893-56-1 HCAPLUS
- CN Furo[2,3-b]furan-2,5(3H,4H)-dione, dihydro-6a-methyl-, polymer with phenyloxirane, alternating (9CI) (CA INDEX NAME)

CM 1

CRN 98546-44-2

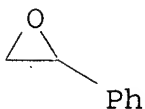
CMF C7 H8 O4



CM 2

CRN 96-09-3

CMF C8 H8 O



- IT 160893-56-1P, 2,8-Dioxa-1-methylbicyclo[3.3.0]octane-3,7-dione-styrene oxide alternating copolymer  
(crosslinking reaction of bicyclic bis(.gamma.-lactone) with triglycidyl isocyanurate and properties of products)

L47 ANSWER 3 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN  
2004:431918 Document No. 141:140869 Synthesis of Ultralarge Molecular Weight Bottlebrush Polymers Using Grubbs' Catalysts. Jha, Sheuli; Dutta, Samrat; Bowden, Ned B. (Department of Chemistry, University of Iowa, Iowa City, IA, 52242, USA). Macromolecules, 37(12), 4365-4374 (English) 2004. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB This paper describes two methods to synthesize bottlebrush polymers with mol. wts. from 1 million to over 60 million g mol<sup>-1</sup> using Grubbs' first and second generation catalysts. In the first method, macromonomers of poly(L-lactide) were synthesized using tin(II) 2-ethylhexanoate and terminated on one end with a norbornyl group. Grubbs' first generation catalyst polymd. macromonomers with one poly(L-lactide) chain per norbornene, and Grubbs' second generation catalyst polymd. macromonomers with two poly(L-lactide) chains per norbornene. The predicted and measured mol. wts. closely matched each other, and the polydispersities of the bottlebrush polymers were between 1.05 and 1.39. These examples are the first where Grubbs' second generation catalyst can be considered living for ROMP. In the second method, the backbone was polymd. first, and polylactide arms with mol. wts. from 15 000 to 50 000 g mol<sup>-1</sup> were polymd. from the backbone. Polymers that were shaped as spheres or rigid rods were synthesized. The polymers were analyzed by GPC, MALLS, QELS, and <sup>1</sup>H NMR.

IT 724785-18-6P 724785-19-7P 727654-88-8P

(prepn. of ultralarge mol. wt. bottlebrush L-lactide-norbornene graft copolymers using Grubbs' catalysts for ROMP)

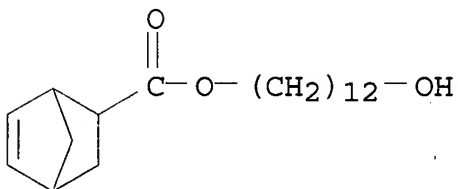
RN 724785-18-6 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 12-hydroxydodecyl ester, polymer with (3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione, graft (9CI)  
(CA INDEX NAME)

CM 1

CRN 724785-10-8

CMF C20 H34 O3

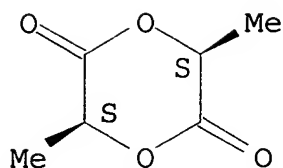


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



RN 724785-19-7 HCAPLUS

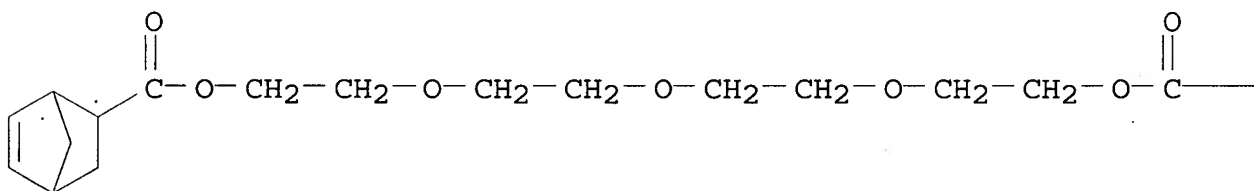
CN Bicyclo[2.2.1]hept-5-ene-2-carboxylic acid, 15-hydroxy-14-(hydroxymethyl)-14-methyl-13-oxo-3,6,9,12-tetraoxapentadec-1-yl ester, polymer with (3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione, graft (9CI) (CA INDEX NAME)

CM 1

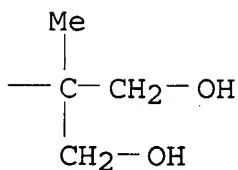
CRN 724785-12-0

CMF C21 H34 O9

PAGE 1-A



PAGE 1-B

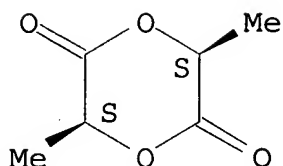


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



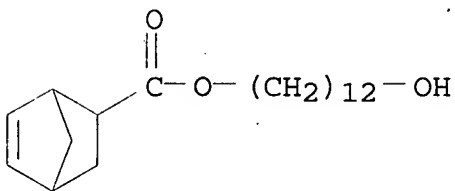
RN 727654-88-8 HCAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer,  
12-[(bicyclo[2.2.1]hept-5-en-2-ylcarbonyl)oxy]dodecyl ester (9CI)  
(CA INDEX NAME)

CM 1

CRN 724785-10-8

CMF C20 H34 O3



CM 2

CRN 33135-50-1

CMF (C6 H8 O4)x

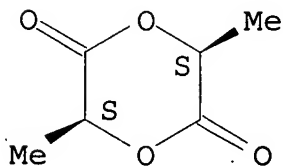
CCI PMS

CM 3

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.





IT 724785-18-6P 724785-19-7P 727654-88-8P

(prepn. of ultralarge mol. wt. bottlebrush L-lactide-norbornene graft copolymers using Grubbs' catalysts for ROMP)

L47 ANSWER 4 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

2003:671142 Document No. 139:180855 Hydroxycarboxylic acid copolymer involving cyclic structure and manufacture of the polymer. Izuhara, Daisuke; Nakamura, Masataka (Toray Industries, Inc., Japan). Jpn. Kokai Tokkyo Koho JP 2003238667 A2 20030827, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2002-46200 20020222.

AB The environment-friendly polymer, having high glass-transition temp. (Tg), is that having hydroxycarboxylic acid-derived repeating units and 5-60% of cyclic hydrocarbon repeating units in the backbone. Thus, 5.0 g L-lactide and 1.3 g bisphenol A-carbonic acid oligomer were polymd. in the presence of Sn(II) octylate under N at 160.degree. for 5 h to give the copolymer having Tg 65.degree..

IT 581772-58-9P, Cyclohexene oxide-L-lactide copolymer (environment-friendly hydroxycarboxylic acid copolymer involving cyclic structure having high glass-transition temp.)

RN 581772-58-9 HCAPLUS

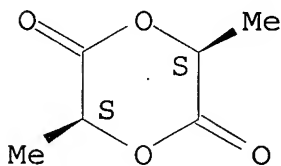
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 7-oxabicyclo[4.1.0]heptane (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

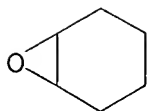
Absolute stereochemistry.



CM 2

CRN 286-20-4

CMF C6 H10 O



- IT 581772-58-9P, Cyclohexene oxide-L-lactide copolymer  
(environment-friendly hydroxycarboxylic acid copolymer involving cyclic structure having high glass-transition temp.)
- L47 ANSWER 5 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN  
2003:114309 Document No. 138:304643 In Situ Generation of Carbenes: A General and Versatile Platform for Organocatalytic Living Polymerization. Nyce, Gregory W.; Glauser, Thierry; Connor, Eric F.; Moeck, Andreas; Waymouth, Robert M.; Hedrick, James L. (IBM Almaden Research Center, San Jose, CA, 95120, USA). Journal of the American Chemical Society, 125(10), 3046-3056 (English) 2003. CODEN: JACSAT. ISSN: 0002-7863. Publisher: American Chemical Society.
- AB A metal-free, organocatalytic approach to living polymn. using N-heterocyclic carbenes as nucleophilic catalysts generated and used in situ in a single-pot process is detailed. The N-heterocyclic carbene catalyst platform is extremely versatile, as the nature of the substituents has a pronounced effect of catalyst stability and activity toward different substrates. The generation of imidazolium- and thiazolium-based carbenes was accomplished from the reaction of the corresponding salts with the appropriate bases. This allowed the rapid screening of libraries of catalysts that provided a basic understanding of catalyst structure (sterics, electronics, etc.) with the polymn. rate, control, substrate, and range of mol. wts. The imidazole-based catalysts were significantly more active toward ROP than the thiazolium-based analogs. No appreciable differences between imidazol-2-ylidene and imidazolin-2-ylidene catalysts were obsd. Less sterically demanding carbenes were found to be more active toward ring-opening polymn. (ROP) than their sterically encumbered analogs for lactone polymn. These data prompted the investigation of ionic liq. as a precatalyst reservoir in a phase-transfer polymn. with an immiscible THF soln. of monomer and initiator. In situ activation of the ionic liq. generates carbene that migrates to the org. phase effecting living ROP. Precatalyst (ionic liq.) regeneration terminates polymn. This simple reaction/recycle protocol readily allows repetitive ROPs from the ionic liq. using com. available materials.
- IT 509079-93-0P, L-Lactide homopolymer bicyclohept[2.2.1]-2-ene-5-methanol ester  
(living ring-opening polymn. of lactones using N-heterocyclic carbenes as nucleophilic catalysts)

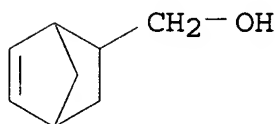
RN 509079-93-0 HCAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer,  
bicyclo[2.2.1]hept-5-en-2-ylmethylester (9CI) (CA INDEX NAME)

CM 1

CRN 95-12-5

CMF C8 H12 O



CM 2

CRN 33135-50-1

CMF (C6 H8 O4)x

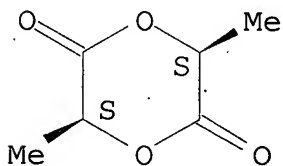
CCI PMS

CM 3

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.

IT 509079-93-0P, L-Lactide homopolymer bicyclohept[2.2.1]-2-ene-  
5-methanol ester(living ring-opening polymn. of lactones using N-heterocyclic  
carbenes as nucleophilic catalysts)

L47 ANSWER 6 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

2002:631124 Document No. 138:39793 Maleimido-functionalized  
spirobis lactone having enhanced volumetric expansion on  
polymerization. Hao, Jianjun; Wang, Wenyun; Jiang, Bibiao; Jiang,  
Luxia; Cai, Xingxian (Department of Polymer Science and Materials,  
Sichuan University, Chengdu, 610065, Peop. Rep. China). Polymer,

43(21), 5771-5774 (English) 2002. CODEN: POLMAG. ISSN: 0032-3861. Publisher: Elsevier Science Ltd..

AB An approach to enhancing the volumetric expansion on polymn. of spirobislactone is proposed.. This approach suggests a mol. modification of spirobislactone through attaching a rigid pendant segment bearing maleimido group to its arom. ring. An addnl. volumetric expansion is achieved from loose mol. packing in cured resins due to the steric hindrance effect among rigid pendent segments. Thus a new monomer, maleimido-functionalized spirobislactone (MFS), is prepd. In order to evaluate the volumetric expansion of MFS during curing, tetraglycidyl 4,4'-diaminodiphenylmethane (TGDDM) is employed to cure with MFS. The volumetric expansion of MFS on curing is measured to be 12.3%, higher than that of net spirobislactone monomer. The existence of loose mol. packing in MFS/epoxy cured resins is demonstrated by morphol. observation of the cured resin stained by the phosphotungstic acid (PTA), and the stained regions are obsd. to be nanoparticles. Such a cured resin, prepd. from 20 mol% of MFS and 80 mol% of TGDDM epoxy resin, shows excellent toughness (Charpy impact strength 13,000 J/m<sup>2</sup>) and good mech. strength (flexural strength 120 MPa, storage flexural modulus 4.2 GPa). Its glass transition temp. by dynamic mech. thermal anal. (DMA) attains 227.degree., much higher than that of the cured resin from net spirobislactone and epoxy resin.

IT 478798-03-7

(volumetric expansion during polymn. of maleimido-functionalized spirobislactone with tetraglycidyl diaminodiphenylmethane)

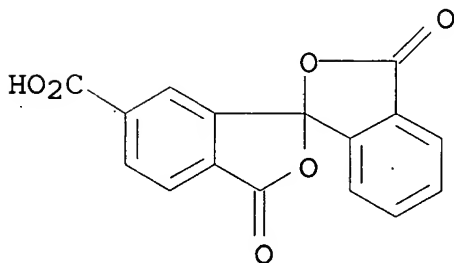
RN 478798-03-7 HCAPLUS

CN 7-Oxabicyclo[4.1.0]heptane-3,4-dicarboxylic acid, bis(oxiranylmethyl) ester, polymer with 3,3'-dioxo-1,1'(3H,3'H)-spirobiisobenzofuran-6-carboxylic acid (9CI) (CA INDEX NAME)

CM 1

CRN 129684-58-8

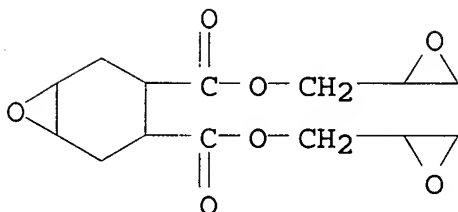
CMF C16 H8 O6



CM 2

CRN 25293-64-5

CMF C14 H18 O7



IT 478798-03-7

(volumetric expansion during polymn. of maleimido-functionalized spirobis(lactone) with tetraglycidyl diaminodiphenylmethane)

L47 ANSWER 7 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

1995:364492 Document No. 122:106702 Anionic Ring-Opening Alternating Copolymerizations of Bicyclic and Spirocyclic Bis(.gamma.-lactone)s with Epoxides via a Tandem Double Ring-Opening Isomerization of the Bis(lactones). Takata, Toshikazu; Tadokoro, Atsuhito; Chung, Keunwo; Endo, Takeshi (JAIST, Ishikawa, 923-12, Japan). *Macromolecules*, 28(5), 1340-5 (English) 1995. CODEN: MAMOBX. ISSN: 0024-9297. Publisher: American Chemical Society.

AB Anionic copolymn. of several bicyclic and spirocyclic bis(.gamma.-lactones) with various epoxides were carried out at 120.degree. in THF in the presence of potassium tert-butoxide (4 mol %) as the anionic initiator. The copolymn. of bicyclic bis(.gamma.-lactones) (7-substituted 1,6-dioxabicyclo[3.3.0]octa-2,5-diones) with glycidyl Ph ether (I) smoothly proceeded regardless of the structure of the substituent at the 7-position of lactones to give corresponding copolymers in 44-78% yield. The copolymer structures were detd. as the alternating copolymers by their IR and <sup>1</sup>H and <sup>13</sup>C NMR spectra. The copolymn. of spirocyclic bis(.gamma.-lactone) (1,6-dioxaspiro[3.3]octa-2,7-dione) with I was sluggish but was accelerated by addn. of a crown ether (8 mol %) to the polymn. system to yield the alternating copolymer in 80% yield. The copolymn. of dibenzo deriv. of spirocyclic bis(.gamma.-lactone) with I gave 81% yield of the alternating copolymer in the absence of the crown ether. The copolymn. of bis(.gamma.-lactones) with a variety of epoxides were carried out, and the effect of the epoxide structure was examd. As a result, both the steric hindrance and polarity of epoxide were suggested to influence the rate of the copolymn. Thermal properties such as glass transition and 10% wt.

loss temps. of the alternating copolymers were evaluated by DSC and TGA.

IT 160893-56-1P

(prepn. and thermal properties of alternating polymers of bis(.gamma.-lactone) with epoxides)

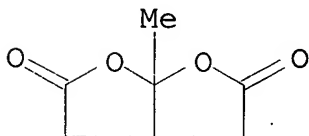
RN 160893-56-1 HCAPLUS

CN Furo[2,3-b]furan-2,5(3H,4H)-dione, dihydro-6a-methyl-, polymer with phenyloxirane, alternating (9CI) (CA INDEX NAME)

CM 1

CRN 98546-44-2

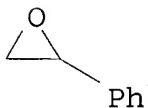
CMF C7 H8 O4



CM 2

CRN 96-09-3

CMF C8 H8 O



IT 160893-56-1P

(prepn. and thermal properties of alternating polymers of bis(.gamma.-lactone) with epoxides)

L47 ANSWER 8 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

1994:324346 Document No. 120:324346 Polymerization of Enantiomerically Pure 2,3-Dicarboalkoxynorbornadienes and 5,6-Disubstituted Norbornenes by Well-Characterized Molybdenum Ring-Opening Metathesis Polymerization Initiators. Direct Determination of Tacticity in Cis, Highly Tactic and Trans, Highly Tactic Polymers. O'Dell, Richard; McConville, David H.; Hofmeister, Gretchen E.; Schrock, Richard R. (Department of Chemistry 6-331, Massachusetts Institute of Technology, Cambridge, MA, 02139, USA). Journal of the American Chemical Society, 116(8), 3414-23 (English) 1994. CODEN: JACSAT. ISSN: 0002-7863.

AB The ring-opening metathesis polymn. (ROMP) of enantiomerically pure dicarboalkoxynorbornadienes (2,3-(CO<sub>2</sub>R\*)<sub>2</sub>-norbornadiene where R\* = (1R,2S,5R)-(-)-menthyl (I) or (R)-(-)-pantalactonyl (II)) with Mo(CHCMe<sub>2</sub>Ph)(NAr)(O-t-Bu)<sub>2</sub> (III) (Ar = 2,6-i-Pr<sub>2</sub>C<sub>6</sub>H<sub>3</sub>) yields high trans, highly tactic polymers. The ROMP of chiral monomers I and II with Mo(CHCMe<sub>2</sub>Ph)(NAr)[OC(CF<sub>3</sub>)<sub>3</sub>]<sub>2</sub>, Mo(CHCMe<sub>2</sub>Ph)(NAr')[BIPH(t-Bu)<sub>4</sub>], and Mo(CHCMe<sub>2</sub>Ph)(NAr')[(.+.-)-BINO(SiMe<sub>2</sub>Ph)<sub>2</sub>](THF) (IV) (Ar' = 2,6-Me<sub>2</sub>C<sub>6</sub>H<sub>3</sub>) yields high cis, highly tactic polymers. Tacticities can be detd. directly by homonuclear (proton/proton) correlation spectroscopy and decoupling expts. The cis polymers were found to be isotactic; the trans polymers syndiotactic. Related expts. employing enantiomerically pure disubstituted norbornenes (2,3-dicarbomethoxynorborn-5-ene, 2,3-dimethoxymethylnorborn-5-ene, and 5,6-dimethylnorborn-2-ene) showed that high-trans polymers prep'd. with III as the initiator are atactic while high-cis polymers prep'd. with IV as the initiator are isotactic. Bimodal mol. wt. distributions were obsd. in some cases when IV was employed, consistent with slightly different rates of polymn. of enantiomerically pure substrate by the 2 different enantiomers of the racemic initiator.

IT 155377-55-2P

(prepn. and tacticity evaluation of)

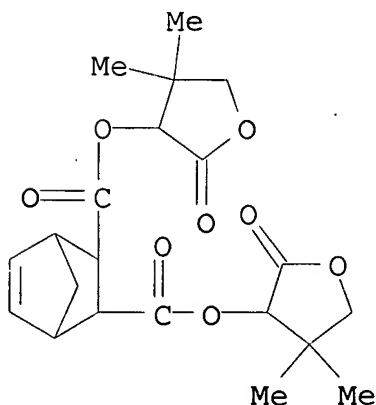
RN 155377-55-2 HCAPLUS

CN Bicyclo[2.2.1]hept-5-ene-2,3-dicarboxylic acid, bis(tetrahydro-4,4-dimethyl-2-oxo-3-furanyl) ester, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 155377-54-1

CMF C21 H26 O8



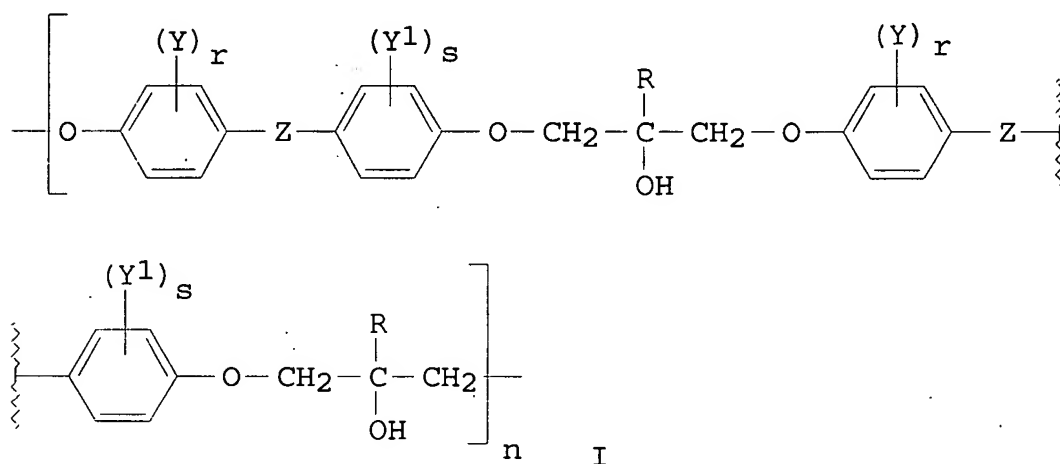
IT 155377-55-2P

(prepn. and tacticity evaluation of)

L47 ANSWER 9 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN

1989:440140 Document No. 111:40140 Preparation of polyhydroxy ethers from bisphenols and cyclic carbonates. Rokicki, Gabriel; Czajkowska, Joanna (Politechnika Warszawska, Pol.). Pol. PL 141286 B1 19870731, 6 pp. Abstracted and indexed from the unexamined application. (Polish). CODEN: POXXA7. APPLICATION: PL 1984-247874 19840528.

GI



AB The polyhydroxy ethers (I) ( $\text{Z}$  = C1-8 alkylene, alkylidene, cycloaliph. derivs. contg. an ether, sulfide, disulfide, sulfoxide, sulfo, ketone, or ethylidene group optionally substituted with 2 halogens;  $\text{X}$ ,  $\text{Y}$  = C1-4 alkyl, halogen, C1-4 alkoxy;  $\text{R}$  = H, Me;  $r$ ,  $s$  = 0-4;  $m$  = 50-200), with low  $\text{O}$  and  $\text{CO}_2$  permeability, useful in packaging, are prepd. by reaction of a bis(cyclic carbonate) with a bisphenol in the presence of  $\text{K}_2\text{CO}_3$  catalyst. Thus, KI 0.2 and 18-crown-6 ether 0.1 were added to Epidian 6 epoxy resin in a stainless steel reactor, and the mixt. was blown 15 min with  $\text{CO}_2$  at 30 atm. After heating for 24 h at 130.degree., excess  $\text{CO}_2$  was released, and the product was cooled, dissolved in ethylene chloride, and crystd. to give 8.2 g 2,2-bis[4-(2,3-dihydroxypropoxy)phenyl]propane dicarbonate. A mixt. of the latter 6.76, bisphenol A 3.42, and  $\text{K}_2\text{CO}_3$  0.1 g was heated to obtain a melt at 190.degree.. The reaction was monitored by sampling and anal. to produce polyhydroxy ether having relative reduced viscosity 0.7 dL/g.

IT 96141-15-0P

(prepn. of, catalysts for)

RN 96141-15-0 HCAPLUS

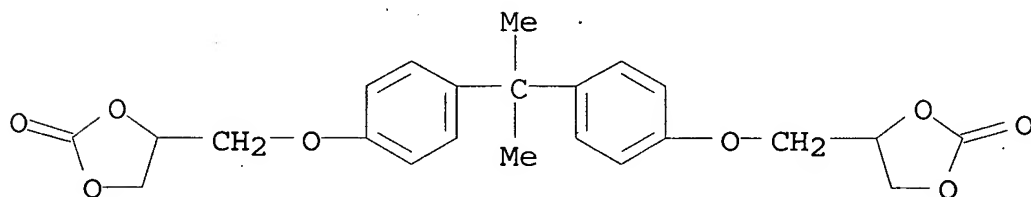


CN 1,3-Dioxolan-2-one, 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, polymer with 4,4'-bicyclo[2.2.1]hept-2-ylidenebis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 85023-51-4

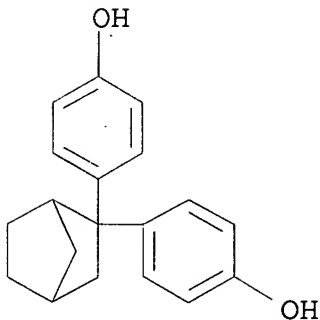
CMF C23 H24 O8



CM 2

CRN 1943-96-0

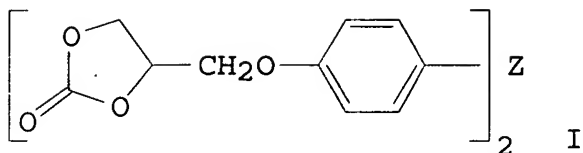
CMF C19 H20 O2



IT 96141-15-0P  
(prepn. of, catalysts for)

L47 ANSWER 10 OF 10 HCAPLUS COPYRIGHT 2005 ACS on STN  
1985:185552 Document No. 102:185552 Cyclic dicarbonates as new  
monomers for the synthesis of poly(hydroxy ether)s. Rokicki,  
Gabriel (Fac. Chem., Tech. Univ. Warsaw, Warsaw, 00-662, Pol.).  
Makromolekulare Chemie, 186(2), 331-7 (English) 1985. CODEN:  
MACEAK. ISSN: 0025-116X.

GI



AB Cyclic dicarbonates(I; Z = CMe<sub>2</sub> or SO<sub>2</sub>) were synthesized from 2,2-bis[4-(2,3-epoxypropoxy)phenyl]propane [1675-54-3] or bis[4-(2,3-epoxypropoxy)phenyl] sulfone [3878-43-1] with CO<sub>2</sub> in the presence of KI/18-crown-6 catalyst, and were used for polycondensation reactions with 6 diphenols, catalyzed by K<sub>2</sub>CO<sub>3</sub> and leading to poly(hydroxy ether)s with CO<sub>2</sub> elimination. The reaction of phenoxymethylethylene carbonate [4437-83-6] with phenol [108-95-2] (including kinetic measurements) was also studied as a model reaction for the formation of the oxy-2-hydroxytrimethyleneoxy group in 1,3-diphenoxy-2-propanol [622-04-8] and the selection of catalysts for the polycondensation.

IT 96141-15-0P

(prepn. of)

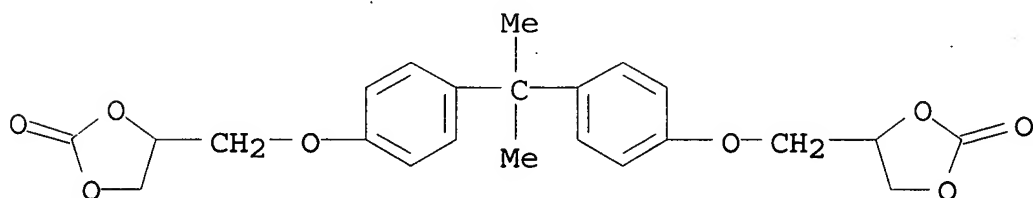
RN 96141-15-0 HCAPLUS

CN 1,3-Dioxolan-2-one, 4,4'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis-, polymer with 4,4'-bicyclo[2.2.1]hept-2-ylidenebis[phenol] (9CI) (CA INDEX NAME)

CM 1

CRN 85023-51-4

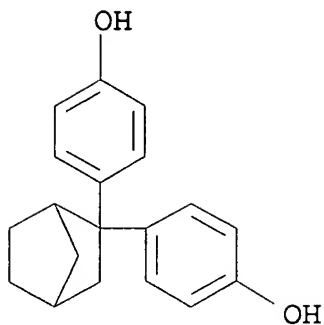
CMF C23 H24 O8



CM 2

CRN 1943-96-0

CMF C19 H20 O2



IT 96141-15-0P  
(prepn. of)